Energy Efficiency Strategies:

Televisions

EECA
Energy Efficiency and Conservation Authority
Te Tari Tiaki Pūngao
Improving energy choices

Preface

Introduction

New Zealand has a trade agreement with Australia, which requires that products lawful for sale in Australia, originating from or through Australia, may be lawfully sold in New Zealand and vice versa. New Zealand is therefore obliged to consider implementing any action taken by Australia affecting the appliance and equipment market.

The Australian Greenhouse Office (AGO) is committed to implement minimum energy performance standards (MEPS) for televisions (TVs) with voluntary energy labelling. Presently the intention is for MEPS and voluntary energy labelling to be introduced in October 2006.

The report

The report provides a New Zealand perspective on Australian proposals to introduce a MEPS and energy labelling scheme. It recommends that a MEPS and energy labelling scheme for TVs should be implemented in tandem with Australia. The MEPS would cover both on-mode and standby energy consumption. The setting of MEPS levels would be designed initially, as in Australia to encourage the removal of the 30% of worst performing TVs from the marketplace and to match the best practice levels of our product source countries.

The total energy use of TVs is estimated to be 320 GWh per year. Savings of 20% of this 320 GWh over the next 5-7 years are expected to be achievable using some form of MEPS. Standby power is also a significant contributor to the overall TV power use, and a reduction of some 30% could be achieved, with a long term goal of reducing TV standby consumption from around 6W to less than 1W.

EECA's intended course of action

EECA will release this scoping report and commission a regulatory impact statement. We will then consult with industry and other interested parties. After consideration of industry feedback, a recommendation will be forwarded to Government regarding the possible adoption of MEPS and voluntary labelling.

Minimum Energy Performance Standards – Televisions

a study for the

Energy Efficiency and Conservation Authority

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produced by

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Minimum Energy Performance Standards – Televisions

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GLOSSARY

AGO	Australian Greenhouse Office
ANZ	Australian and New Zealand
AS	Australian Standard
AS/NZS	Joint Australian and New Zealand standard
BAU	Business as Usual
BRANZ	Building Research Association of New Zealand
CO_2-e	Carbon dioxide equivalent
Comparative label	A type of product label that indicates not only that the product meets specific energy or environmental criteria, but allows comparison between products by ranking.
CRT	Cathode Ray Tube
DVD	Digital Video Disk
DVB	Digital Video Broadcasting
EECA	Energy Efficiency and Conservation Authority
Endorsement label	A type of product label that indicates a product meets specific criteria (i.e. energy or environmental). The label does not allow comparison between eligible products.
EER	Energy Efficiency Ratio
EEI	Energy Efficiency Index, a measure which indicates the efficiency of TVs in both the On and Standby mode.
GEEA	Group for Energy Efficient Appliances (Europe)
HDTV	High-definition television
HEEP	Household Energy End-use Project (BRANZ/EECA)
IRD	Integrated receiver decoder
LCD	Liquid Crystal Display
MCE	Ministerial Council on Energy (Australia)
MEPS	Minimum Energy Performance Standards
NAEEEP	National Appliance and Equipment Energy Program (Australia)
NAEEEC	National Appliance and Equipment Energy Efficiency Committee (Australia)
NFEE	National Framework for Energy Efficiency (Australia)
NPV	Net present value
Ownership	The ratio of stock to the total number of households.
Penetration	The proportion of households in which a particular appliance type is present (irrespective of the number of units of that appliance in the household).
Saturation	The number of specified appliances per household, for those households that have the appliance.
SDTV	Standard-definition television
Statistics NZ	Statistics New Zealand
STB	Set top box
TTMRA	Trans-Tasman Mutual Recognition Agreement
TV	Television
VCR	Video cassette recorder

Executive Summary

This report provides a New Zealand perspective on Australian proposals to introduce a MEPS and comparative labelling scheme. It recommends that a MEPS and comparative labelling scheme for televisions in New Zealand should be implemented in tandem with Australia. The MEPS should cover both on-mode and standby energy consumption. The setting of MEPS levels should be designed initially, as in Australia to encourage the removal of the 30% of worst performing TVs from the marketplace, and to match the best practice levels of our product source countries.

Since the scheme will probably now be voluntary, consultation with the importers and major retailers will be necessary to ensure that there is no undue resistance to the scheme, to maximise compliance and adherence to the principles of the scheme.

The most common form of television used in the residential sector in both New Zealand and Australia is still the analogue colour TV using cathode ray tube technology. However the sales volume of slimline televisions (LCD, plasma and rear projection) is increasing rapidly almost doubling from 5.2 to 9.6% last year. The features offered by TVs now include 100 Hz picture frequency, widescreen format, and stereo which all increase the power of the set. Another significant change will be the introduction of digital television. Consumers with analogue sets will have to purchase a set top box to convert digital broadcasts to analogue, although integrated receiver decoder sets will come to market soon.

New Zealand imports all of its TVs, and has done so since 1990-91, and Australia is also now primarily an importer of televisions. The main source for New Zealand supply is China, with a smaller number originating in Europe, Japan, and Korea.

The total number of TVs in New Zealand is estimated at 2,785,600, a 98% penetration. Of these 590,200 are single TV households. The numbers of TVs currently sold each year is currently 318,847 an increase of 25% on the previous year. The current economic life of standard CRT style TVs is assessed as averaging 7 years.

The total energy use of TVs is estimated to be 320 GWh per year, which is of the order of 40% of the annual energy increase for New Zealand of 800 GWh. Savings of 20% of this 320 GWh over the next 5-7 years are expected to be achievable using some form of MEPS, and would contribute significantly to lowering New Zealand's energy growth profile. Standby power of around 6W is also a significant contributor to the overall TV power use, and a reduction of some 30% could be achieved, with a long term goal of less than 1W.

In Europe, there are a number of initiatives to encourage industry best practice through a voluntary energy labelling scheme, which uses an Energy Efficiency Index. At least 20% of analogue TVs already on the market in Europe comply with this index. Mandatory or obligatory programs are the Japanese Top Runner program, and China is planning the imminent introduction of a labelling and MEPS program within the next year. However "business as usual" will also produce a natural reduction in energy usage for TVs of 2% per year from savings due to design improvements by manufacturers.

It will be important to ensure that a New Zealand or Australasian MEPS scheme is compatible with other national schemes that have a larger manufacturing or consumer base. It is anticipated that contracts for TV purchase will have to include requirements for type testing from overseas test laboratories and possibly labelling.

The effect of the Trans-Tasman Mutual Recognition Agreement means that goods that are acceptable for sale in one jurisdiction can legally be sold anywhere in Australia and New Zealand. If Australia has a mandatory MEPS regime – which now seems unlikely – and New Zealand does not, theoretically it would be possible to import non-compliant TVs to Australia although the dangers are more apparent than real.

The introduction of a MEPS scheme would see annual energy savings increase from 8 GWh in 2006 to 29 GWh in 2025, with a cumulative saving in this period of 392 GWh. In addition avoided power costs would save additional carbon charges with a net present value of the cumulative savings till 2025 of $10.78 million.

The cost of applying MEPS would be largely absorbed by retailers and consumers, but could attract annual administration costs of $100,000 with an NPV of $2.2 million. Compared with the NPV of the electricity saved of $8.3 million, there is a substantial benefit cost ratio of almost four. If the savings in carbon charges are included the benefits are almost doubled.

Although Australia originally aimed to introduce a combined MEPS/labelling scheme by 2006, recent stakeholder feedback in Australia has opposed mandatory labelling, and it is now unlikely to proceed, although voluntary labelling and MEPS will still go ahead. It would still be advisable to keep our alignment with Australia, and it is recommended that New Zealand introduce a similar scheme to whatever is finally agreed to in Australia.

Further consultation with the importers and major retailers will be necessary to ensure that there is no undue resistance to the scheme, to maximise compliance and adherence to the principles of the scheme. It should be possible to introduce such a MEPS and labelling scheme by the end of 2006 if decisions and consultation begin as soon as possible.

1 Introduction

1.1 Background

In November 2004 the Energy Efficiency and Conservation Authority commissioned Wise Analysis Ltd to provide a review of the document "Minimum Energy Performance Standards – Televisions"[1] which was prepared for the Australian Greenhouse Office by Energy Consult Pty Ltd. In particular this report was to "provide a New Zealand perspective to the differences between the two countries with respect to:

- markets, including a quantitative discussion compatible with the section entitles "Market Profile"
- available technologies
- economic implications (especially costs, and energy savings)."

As background to the Australian report, the Australian National Appliance and Equipment Energy Efficiency Committee (NAEEEC) had tracked over three years the energy usage – in particular standby power consumption – of appliances sold in retail outlets across Australia. NAEEEC also had an intrusive survey of standby consumption in households, and had a telephone survey done of 800 households to determine appliance ownership and usage. This meaningful research data became the backbone of the Australian Government's standby policy development.

Leading on from this research, in 2002 the Australian Ministerial Council on Energy in 2002 released a policy document *Money Isn't all You're Saving*[2] outlining Australia's Standby Power Strategy 2002 – 2012. The strategy outlined the products and appliances that required "immediate" or "subsequent" action in the standby power program, among which were televisions[3]. Further research for NAEEEC[4] suggested that a program that examined all modes of use including on-mode and not just standby modes, might better meet the Australian government's efficiency goals. A report was thus commissioned to consider a range of policy options, including mandatory measures like appliance energy rating labelling and Minimum Energy Performance Standards (MEPS), to achieve that outcome. The report also investigated the potential for energy and greenhouse savings through the use of a combination of policy tools.

Much of the data in the Australian report, for example on power measurements could not be independently verified, and has been taken as given. In addition the depth of demographic information obtainable in New Zealand was also limited compared with Australia. However the key to the study is not so much the starting data as the assumptions made as to future growth of the stock of televisions, and it's make up and changes to efficiency. The assumptions made in this report are given later in 9.1.

A general comparison of the two countries is given in the following table:

[1] Minimum Energy Performance Standards: Televisions, NAEEEP Report 2004/11 (prepared for prepared for the Australian Greenhouse Office

[2] *Money Isn't All You're Saving*, Australia's Standby Power Strategy 2002-2012, MCE

[3] Where ever the term "televisions" appears in this report without further descriptive information, the term covers all television types, including digital, wide screen, plasma, rear projection, CRT, etc.

[4] Sustainable Solutions *A Study of Home Entertainment Equipment Operational Energy Use Issues*. NAEEEC 2003

Table 1: General comparison between New Zealand and Australia

	New Zealand	Australia
Area	268,000 sq km	7,682,300 sq km
Population	4 million	20 million
GDP	$120 billion = A$105 billion	$750 billion
Per capita GDP	NZ$30,000 = A$26,000	A$37,000
Principal exports	Primary (rural) products (54%)	Resources (45%), rural (30%)

On a purely population basis the ratio between Australia to New Zealand is thus approximately fivefold.

2 Product Description

2.1 General

Analogue colour televisions using cathode ray tube (CRT) technology are currently the most common form of television used in the residential sector in both New Zealand and Australia. They are based on the European PAL system with free to air broadcasts using VHF and UHF bands. There are also various pay TV broadcasts made using UHF via microwave, and satellite and cable using digital technology (these usually go through a converter/decoder to product a suitable analogue output).

The most significant change coming to television in both Australia and New Zealand since its introduction in 1950s is the introduction of digital television which is currently being trialled in Auckland, and was enabled in Australia in 2001 by legislation. Digital television was launched in the five mainland metropolitan areas (Sydney, Melbourne, Adelaide, Perth and Brisbane) on 1 January 2002. In Australia, broadcasters are required to deliver a hybrid system of SDTV with some HDTV programming where possible. Broadcasters in Australia must provide at least 20 hours of digital programs within two years of commencing. Trial digital TV broadcasts are being made in Auckland.

For consumers, digital television means clearer, sharper pictures and a reduction in the interference and ghosting that currently affect many viewers in built-up areas or where there is hilly terrain. The change to digital television will also enable viewers to receive datacasting and enhanced television services that may include subtitles, captioning, further information on programming and a choice of viewing angles. No date for the ceasing analogue transmission has been set in New Zealand, although 2008 has been quoted for Australia. To be able to watch television, consumers with analogue sets will have to purchase a set top box (STB) which will convert digital broadcasts to analogue.

The Television New Zealand 2004 annual report states that: “For New Zealand households to convert to a fully digital environment there needs to be investment in new distribution infrastructure as well as additional and enhanced services from television broadcasters. This infrastructure will take at least a decade to implement.” This would put the date at which the changeover to digital technology could occur at approximately 2014, although some service could be introduced gradually before then.

Digital television signals can be transmitted in either standard definition or high definition. Standard-definition television (SDTV) reportedly has improved reception capability when

compared with existing analogue services while High-definition television (HDTV) provides cinema-quality viewing with surround sound. Digital television will be broadcast in wide-screen format in both SDTV and HDTV (HDTV broadcasting began only recently). New Zealand has committed to the Digital Video Broadcasting (DVB) European-based standards.

A summary of the options available to consumers is as follows:

2.2 Transmission Types

The type of transmission affects the configuration of televisions and thus the features supplied, which in turn affects the power consumption of the set.

(a) Analogue

This is currently the most widely available transmission option that comes at no additional cost to the consumer other than the initial purchase of a television unit. Television units using this method of transmission will require a STB to receive a signal as analogue is phased out and digital transmission phased in around 2008 in Australia, and probably later in New Zealand.

(b) Standard-Definition TV (SDTV)

SDTVs give the consumer all of the benefits of the basic set-top box as well as a digital picture in widescreen format. New Zealand is planning to introduce SDTV digital TV transmission in the future.

(c) High Definition TV (HDTV)

HDTVs receive both HDTV and SDTV signals and display digital HDTV pictures in cinema quality, wide-screen 16:9 format. A HDTV set will also provide all of the benefits of a basic set-top box. More common in the market are Digital Display Devices, which will display both SD and HD signals in a 16:9 wide-screen format.

Digital Display Devices are typically LCD or plasma screens which will only display digital signals and require a set-top box to receive the digital or analogue TV transmission and convert it to digital.

2.3 Television Receiver Types

A brief description of television types is provided below. All of the television types described below with the exception of CRT television types may have the standard analogue, SDTV or HDTV receiver types. More detail on the technology used is provided in NAEEEP Report 2004/11[5].

2.3.1 TV Technology

There are a number of technologies used to display the image to be viewed. Common technologies however relate to features such as passive standby. Older sets had an on/off switch which physically removed the electricity supply from power supply components. The

[5] NAEEEP Report 2004/11 (Appendix B: Television Technology Types p17).

advent of remote switching controls made it imperative that the voltage was removed by a solid state switching device, able to be turned on by the remote control. But this "holding off" uses power itself, and when the TV is in this mode it is termed "passive standby" or just standby. In this report where standby is used it means passive standby. The same technology is used for other remote controlled devices such as set top boxes.

(a) Standard Cathode Ray Tube (CRT)

As noted in 2.1, most existing televisions in Australia and New Zealand use cathode ray tube (CRT) technology and these existing televisions are usually set up to receive analogue broadcasts. CRT TVs can be purchased in standard (4:3) or wide screen format (16:9).

The features provided by a TV affect the power usage. The features on a CRT TV that have most impact on power (with the mean effect in brackets – Huenges Wajer et al[6]) are 100 Hz picture frequency (37.8W), stereo sound (11.5W), surround sound (15.2W), second tuner (12.2W), satellite tuner (10.1W). Not all these features are offered in New Zealand. Screen size itself has a relatively minor effect.

(b) Slimline televisions

While the sales volume of slimline televisions in New Zealand in 2003 was 5.2% compared with 95% CRT, by 2004 this had increased to 9.6% slimline televisions. Sales of LCD TVs in Australia have also been low to date, largely because of their cost, but recent improvements to LCD technology and an international trend toward LCD televisions may see prices fall and the market share increase. LCD televisions boast lower energy consumption levels compared with other television types. For example the NAEEEC Store Survey measurements showed a mean-in-use power of 56.4W for LCD sets compared with 79.1W for CRT sets.

(i) Liquid Crystal Display (LCD)

LCD televisions utilise the same technology as computer monitors and until very recently have had smaller screens than conventional full sized CRT technology and plasma units. They were also considerably more expensive than CRT technology, comparable size for size with plasma screens. However, LCD televisions are brighter, crisper, and have a better contrast ratio and a better viewing angle compared to plasma units and a much greater life expectancy.

(ii) Plasma Screens and TVs

In simple terms plasma screens are made up of lots of tiny fluorescent lights to produce a high quality image for television viewing. The technology allows for a greater viewing angle - 160 degrees compared to about 60 degrees in the standard CRT televisions. As such, it isn't necessary to be directly in front of the television to be able to view the picture. Plasma screens boast a wide-screen format, light weight and low radiation compared to CRT television types. Many of the plasma screens available require a set top box, VCR or home theatre package to produce images, as they do not contain a TV tuner, although more models are now being produced that do contain an integrated digital or analogue tuner. Plasma televisions are plasma screens with built in television tuners.

[6] Huenges Wajer B.P.F., Siderius P.J.S., *Analysis of Energy Consumption and Efficiency Potential for TVs in on-mode, EC report November 1998* http://www.vhknet.com/download/TV_on-mode_final_report.pdf

Plasma and rear projection sets use approximately double the power of CRT type TVs. For example the NAEEEC Store Survey measurements showed a mean-in-use power of 156.5W for Plasma sets, and 150.4W for projection sets, compared with 79.1W for CRT sets.

(iii) Rear Projection

Rear projection televisions are wide-screen televisions that beam images from three picture tubes (CRTs) or LCD projectors to the back of a 102 cm to 150-plus cm screen. The main attraction of rear projection televisions is that they provide a wide-screen or cinematic view for a more comparable price to plasma or LCD wide-screen television technologies. These screens can be in the 4:3 or 16:9 format.

(iv) Set top boxes

Set top boxes for conversion of digital to analogue signals are similar to the decoders presently used by Sky and Telstra. Typical energy consumptions range between 12W and 17W. Standby figures would typically be 8 to 10W or less (see Table 7). Standby figures of 2W are achievable.

2.3.2 TV Formats

Regular televisions have a width to height ratio (or aspect ratio) of 4:3, whereas widescreen televisions have an aspect ratio of 16:9, making the unit almost twice as wide as it is high. A VCR normally shows videos in the standard format, while a DVD player has options to enable the user to watch movies in wide-screen format. The wide-screen is designed to give the user a greater television experience by making the television appear more like a cinema screen. The actual screen size of wide-screen televisions varies and usually starts at around 66cm. There are many variations on the types of wide-screen televisions available and these are described in detail overleaf.

2.4 Sources of Product

New Zealand imports totally all of its televisions, and has done for many years. Australia is also primarily an importer of televisions, with the exception of one brand Matsushita that still manufactures in NSW.

The primary source for New Zealand supply is China, with a smaller number originating in Europe, Japan, and Korea. However the place of manufacture is diverse, leading to televisions being imported from a wide range of countries, mainly throughout Asia.

3 Market Profile

3.1 All Television Types

Television manufacturing and assembly in New Zealand finally ceased in 1990-91 with Fisher & Paykel, the licensees for Panasonic being the last. Colour televisions first became readily available in New Zealand in 1974 to coincide with the country's hosting of the 1974 Commonwealth Games (black and white TV transmission was first introduced in New Zealand in 1960).

Data on the overall ownership profile for televisions in New Zealand became limited when licensing ceased in 1999, and data collection is now only carried out by Statistics New Zealand and through surveys by firms such as A C Nielsen, all of whom charge for detailed information.

The data in Table 2 was obtained from Statistics New Zealand's Household Economic Survey, and excludes TVs in commercial premises such as hotels. In using it for the purposes of economic analysis, it will thus produce conservative numbers. It does indicate that the number of principal (first or only) TVs in households is 1,463,900 compared with a total number of TVs of 2,785,600, i.e. on average almost every household has two TVs.

Table 2: Estimated number of TVs in households for the year ended June 2004

Number of TVs in household	Estimated number of households	Percent	Total No of TVs	Equivalent Australian Data (2000) %
0	30,600	2	0	0.5
1	590,200	39.5	590,200	38.6
2	541,900	36.3	1,083,800	39.4
3	242,200	16.2	726,600	15.3
4	63,000	4.2	252,000	) 6.2
5+	26,600	1.8	133,000	)
Total all households	**1,494,500**	**100**	**2,785,600**	**100**

Note: *Household numbers are rounded to the nearest hundred*
Source: *Statistics New Zealand, Household Economic Survey*

The available Australian data suggests that television penetration probably increased linearly from 0% in 1956 (the date of introduction) to about 90% by 1975. The New Zealand data appears to lag the Australian data slightly in some categories, but probably not significantly. Television ownership is in excess of 1.86 televisions per household.

Table 3: Penetration of Television Ownership – Australia & New Zealand

New Zealand (Year and source)		Australia (Year and source)	
1959 (no TV)	0%	1955 (no TV)	0%
		1961 (Census – NSW)	48%
		1966 (Census – NSW)	70%
		1970 (Census – NSW)	90%
		2000 (NAEEEC)	99.5%
2004 (Statistics NZ)	98%		

The average age of TVs in New Zealand is not known. Current economic life of standard CRT style TVs is assessed as averaging 7 years, with 70% falling between 6-11 years. Before the advent of video game accessories such as Playstation and X-Box older TVs were passed on to children for their bedroom, or taken to holiday homes. However with the advent of Audio/Video (A/V) input requirements for Playstations etc, more modern TVs were demanded by users. As the prices for smaller new TVs dropped, the older stock was replaced, although the older sets probably still account for the 22% of homes with 3 or more TVs.

Based on a seven year life, the stock of TVs in households owning one and two TVs is approximately 1.7 million and an approximate sales figure would be one seventh, or 240,000

per year plus an allowance for market growth. Figures for sales into the retail market show that the New Zealand market for the last three years is as follows:

Table 4A: New Zealand annual TV market based on type

	2001-02 units	2002-03 units	2003-04 units
Standard 4:3	173,967	231,095	272,080
Widescreen 16:9	9,170	23,089	40,784
Unidentified		875	5,983
Total	**183,967**	**255,059**	**318,847**

Table 4B: New Zealand annual TV market based on feature

	2001-02 units	2002-03 units	2003-04 units
CRT	178,603	242,474	290,499
LCD	100	1,604	7,846
Rear projection	4,222	8,906	13,887
Plasma	212	2,075	6,152
Unidentified			463
Total	**183,967**	**255,059**	**318,847**

The sales of new TVs in 2004 are 11.45% of the total number of TVs estimated to be in the country. On that basis the stock is replaced approximately just under every nine years. This equates to the assessed current economic life of seven years for TVs assessed by manufacturers.

The size of the New Zealand market, as an influencing tool is small. With typical factory production rates of 75,000 units per month, the entire New Zealand market can be supplied by just over four month's production in Europe or China from a single factory.

The market share data for New Zealand is not readily available, but the market is dominated by three major players – Philips, Sony and Panasonic who together account for 80% of total sales[7]. The comparable figures for market share in Australia by these manufacturers, is only 19.5%. The market in New Zealand is thus more concentrated in the hands of major players, than in Australia. However the total number of brands is still similar, but the lesser known brands have only a niche market.

3.2 Wide-screen Televisions

Slimline TVs - the majority of which are widescreen format - have increased their share of the market from 4.9% to 8.7% between 2003 and 2004, an increase of 77%, compared with an increase in CRT sets of only 20%. This suggests that both slimline and wide-screen televisions are increasing their market share in New Zealand rapidly at the expense of traditional CRT models.

Very little Australian data exists on penetration and ownership of wide-screen televisions either. Between 2001 and 2002 sales figures reportedly tripled. Between 2002 and 2003 sales of widescreen CRT TVs increased by 50%, plasma TVs by 100% and LCDs increased from a zero base. The overall increase was 78%.

[7] Personal communication from Garth Wyllie, Consumer Electronics Association of New Zealand.

Summary – TV demographics

The total number of TVs in New Zealand is around 2,785,600 with overall television penetration is around 98%. Television ownership is now in excess of 1.86 televisions per household and increasing slightly. The TV market is dominated by three major suppliers – Sony, Philips and Panasonic. Slimline TVs are increasing their market share with almost a doubling of sales between 2003 and 2004. If CRT widescreens are included, there was probably a trebling of this sector.

4 Energy Consumption

4.1 Household Energy Consumption

The impacts of policies to improve the efficiency of televisions is based largely on future sales of TVs, and changes to the efficiency of these technologies over the next 15 to 20 years given current life expectations of these appliances of seven years.

Energy consumption in New Zealand households has been surveyed since 1997 by BRANZ for EECA in its Household Energy End-use Project (HEEP)[8]. Using data from HEEP the total annual energy consumption of all televisions in New Zealand is estimated to be lie between 70 and 325 GWh.

The usage data for TVs in NZ has been surveyed by BRANZ[9] but the data is inconclusive. For the purposes of this report, an average of 4 hours in-use and 20 hours standby a day has been assumed. Second and subsequent TVs usage is 50% of the principal TV.

The energy consumption is estimated as follows:

Average power usage (in use)		=	80W
Standby		=	6W
Usage:	Watching	=	4 hours/day
	Standby	=	20 hours/day
Average energy usage per day		=	(20 x 6) + (4 x 80) Wh
		=	440 Wh
Total population of TVs		=	2,785,600
Average total energy per year (344 days)		=	422 GWh

> ***Note:*** *344 days is the commonly used figure for number of days used, and assumes 21 days of out of home vacation.*

The figure of 422 GWh assumes that the entire number of TVs in New Zealand of 2,785,600 is used in the same way for a certain number of hours per year, as above. However if only the principal TV in a household with one or more TVs is considered to have the stated usage, i.e. a total principal TV population of 1,463,900 then this figure drops to 221 GWh. Energy usage thus falls within the range from 221 to 422 GWh. A more realistic usage assumption is that the

[8] Stoecklein A., Pollard, A., Isaacs, N. (ed), Ryan, G., Fitzgerald, G., James, B., & Pool, F. 1997 *Energy Use in New Zealand Households: Report on the Household Energy End-use Project (HEEP) – Year 1.* Energy Efficiency & Conservation Authority (EECA), Wellington.
[9] Stoecklein, A. Pollard A., Isaacs N., Bishop S. and James B., Energy end-use and socio/demographic occupant characteristics of New Zealand households, Conference paper CP52, 1998 http://www.branz.co.nz/branzltd/publications/pdfs/con52.pdf

principal TV is assumed to have the assumed usage of 440 Wh above, but second and subsequent TVs in a household use only 50% of this energy or 220 Wh per day. The total energy use would then be 322 GWh. These figures are shown in the following table:

Table 5: Energy usage against TV penetration

Number of TVs in household	Estimated number of households	Total number of TVs	Energy usage GWh (440Wh/day)*
0	30,600	0	0
1	590,200	590,200	89
2	541,900	1,083,800	123
3	242,200	726,600	73
4	63,000	252,000	24
5+	26,600	133,000	12
Total all households	**1,494,500**	**2,785,600**	**322**

* Second and subsequent TVs are assumed to use 50% of this figure.

Total energy consumption of all televisions in Australia is estimated at 1,055 GWh pa in 2003 (Harrington & Foster 1999[10]), and is estimated to increase to 1,361 GWh by 2010. The proportion of total household energy use attributed to televisions is also estimated to be 5% – considerably greater than a clothes washer (1%), clothes dryer (1%) or dishwasher (1%) and only marginally less than refrigerators/freezers (10%). All of these household appliances already carry an energy rating label and freezers are subject to MEPS.

As an indicative figure only, on a population pro rata basis, New Zealand's TV energy consumption would be approximately 20% of the Australian estimate or 211 GWh – somewhat less than the 322 GWh above, even making allowances for New Zealand's population of TVs possibly being somewhat older than the equivalent Australian population.

A best guess estimate is probably that the present energy consumption by all TVs is around 320 GWh. According to some commentators, normal appliance technology improvements under "business as usual" will improve the efficiency of conventional TV designs by around 2% per year (see Table 9). However changes in the market mix may act in the opposite direction. Slimline TVs do not necessarily use less energy - for example LCDs use less energy, but plasma (and projection) TVs use significantly more - 300W or greater. Whilst Table 4B indicates that slimline TVs have only 5% of CRT market share, LCD sales increased fivefold and plasma sales threefold in the last year. Ultimately whether the energy usage continues to fall, will depend whether the market moves more towards LCD or plasma screens in the next 5 to10 years.

New Zealand's total electrical energy consumption is presently of the order of 40,000 GWh, and increasing by 2% per annum (800 GWh). The present total TV energy consumption of 320 GWh is thus of the order of 40% of the annual growth in energy usage. A 10% saving by using some form of MEPS is thus not insignificant in managing the electricity demand profile growth.

[10] Harrington, L & Damnics, M. 2003, *Energy Labelling and Standards Programs Throughout the World*, National Appliance and Equipment Energy Efficiency Committee, Canberra.

4.2 Trends in TV Power Consumption

No available measurement data has been obtained for New Zealand. The energy consumption characteristics of TVs will however be similar to those measured in Australian store surveys and intrusive surveys commissioned by NAEEEC4 over the last four years, and previous studies of residential appliances are summarized below. The report cautions that the data *"should be treated with careful optimism as many factors influence the survey and only future monitoring will reveal if in-use consumption is actually trending downwards"*.

The various television types are discussed below.

(a) Standard CRT Televisions

The data in MEPS-TV (Fig 2ff) shows that the majority of televisions use between 50W and 100W although 2003 saw an increase in those using less than 50W in-use. Average in-use power consumption fell significantly from 2001 from 2002 to 2003 and 2003-04 from around 88W to 79W, a reduction of some 10%.

As well from 2001 to 2004 average standby power fell from around 6W to 4.1W a reduction of some 30%. In the off mode all TVs consumed less than 1W with the vast majority having zero consumption.

(b) LCD Televisions

The data in MEPS-TV (Fig 4ff) was based on limited numbers of units measured, apart from 2003-04. Thus no trend was evident. The average in-use consumption was 56.4W, ranging from 24W to 134W. Standby showed large differences ranging from 0.6W to 18.5W, averaging 2.8W. Data from the European website Market Transformation Program[11] for LCD TVs indicate that for in-use consumption best practice is currently (2003):

Table 6: Best practice for LCD TVs

In-use consumption	Watts	Standby	Watts
Best Practice	35	Best Practice	1
Average	50	Average	3
Maximum	75	Maximum	5

(c) Projection Televisions

The data in MEPS-TV (Fig 7ff) shows an average in-use power of 156W ranging from 94W to 223W. Standby averaged 7.7W ranging from 0.4W to 45W. The average off mode consumption was 0.1W.

(d) Plasma Televisions

Plasma TVs use considerably more energy than other types of TV. The data in MEPS-TV (Fig 9ff) showed average in-use consumption in 2003-04 was 150W, down from 292.4 in 2003. The maximum energy used showed a similar decline. Standby averaged 2.4W, ranging from 0.7W to 4.4W. Some 25% of sets did not have an on/off switch.

[11] URL – http://www.mtprog.com

(e) Set top boxes

Figures for US set top box power usage were given in Rainer et al 2004.[12]

Table 7: Average Set Top Box Power Levels

Type	Standby (W)	In-use (W)
Analogue cable	10	12
Digital cable	22	23
Satellite	16	17
Internet Protocol TV	14	15
Digital TV adaptor	8	17

They say that "Reducing the energy use of set-top boxes is complicated by their multiple complex operating and communication modes. Although improvements in power supply design and efficiency will be effective in reducing STB energy use, the major energy savings will be obtained through the use of protocols and software to better control the device (energy management)."

Summary – TV energy consumption

Overall television energy consumption is around 320 GWh, and could reduce over the next 5-7 years by 20% if a MEPS regime is introduced. Although there is considerable variation between manufacturers, energy consumption of various TV types is likely to continue to fall as technology improves.

5 Technology Scope for Energy Efficiency

A 1998 report by Huenges and Siderius[13] stated that TV in-use energy consumption can be reduced through two options:

- Options regarding components:
  - Use less
  - Use more efficient
  - Use specifically designed components
- Options regarding design (hardware and software)
  - Lower voltages
  - Fewer voltages
  - Power management

At that time the data showed a trend to decreasing power consumption only for smaller TVs (below 49cm). For medium and larger sizes there was still a large variation. Because of their short life times and high ownership growth rates, STBs perhaps also provide a great opportunity for significant short term energy savings.

[12] "What's On the TV: Trends in U.S. Set-Top Box Energy Use, Design, and Regulation" Rainer L, Thorne Amann J., Hershberg C., Meier A., Nordman B, IEA Conference paper URL – http://www.iea.org/dbtw-wpd/textbase/papers/2004/am_stb.pdf

[13] Huenges Wajer B.P.F., Siderius P.J.S., *Analysis of Energy Consumption and Efficiency Potential for TVs in on-mode, EC report November 1998* http://www.vhknet.com/download/TV_on-mode_final_report.pdf

6 Standards Development

There are currently no national or international standards applying to the energy consumption of TVs. A new joint standard, AS/NZS 62087:2004 that defines the methods of measurement for the power consumption of audio, video and related equipment has recently been published. This standard derives from international standard IEC 62087 and covers televisions, VCRs, Set Top Boxes, audio equipment (separate components) and combination equipment (such as integrated stereos).

The Australian government is also currently communicating with the relevant committees on developing a standard that includes voluntary efficiency performance requirements for standby energy consumption. These initial voluntary requirements would be published by SAI in a new part of the AS/NZS 62301, which provides a test procedure to determine the power consumption of a range of appliances in standby mode. The interim standard, which is identical to the IEC draft TC59 WG/9 (IEC 62301) is a provisional Standard with the two year life intended to provide a guide to the direction that future standardisation may take. By then it is anticipated that the IEC standard will have been published and it is expected that this will be subsequently adopted as the joint Australian/New Zealand standard.

7 Test Laboratory Capability

The need for local test laboratories to carry out tests on overseas manufactured TVs has not been demonstrated. It is anticipated that contracts for purchase will include requirements for type testing and possibly labelling. International TV suppliers have been testing to the IEC 62087 for a number of years, and the acceptance of international testing laboratory test results should be acceptable in any proposed MEPS regime.

The ability of local Australasian testing laboratories to perform the tests in accordance with AS62087 is also certainly feasible as the test equipment and methodology is not different from standard testing requirements.

8 International Energy Efficiency Programs

8.1 Voluntary Programs

Various voluntary programs that address standby and in-use power consumption exist internationally. The international ENERGY STAR Program is the only voluntary program that operates in Australia and is recognized in New Zealand. It addresses standby power consumption primarily of office equipment but not currently in-use consumption.

In Europe, there are a number of initiatives that target power consumption in televisions. The Group for Energy Efficient Appliances (GEEA), which is made up of representatives from European national energy agencies and government departments, encourages industry best practice through a voluntary energy labelling scheme, which uses an Energy Efficiency Index that takes into consideration energy consumption in-use. At least 20% of the analogue TVs already on the market in Europe comply with this index.

The European Association of Consumer Electronics Manufacturers (EACEM) established a voluntary agreement in 1997 with the European Commission to target standby losses of TVs. EACEM has now merged its activities with the European Information & Communications Technology Industry Association and is now known as the European Information, Communications and Consumer Electronics Technology Industry Associations (EICTA). The updated agreement covers CRT based televisions, non CRT based televisions and DVD's and now addresses on mode consumption in addition to standby. The aim is to reduce standby power consumption to a maximum of 1W by 2007. The agreement also aims for a minimum of 5% improvement in energy efficiency by 2007.

The energy efficiency index is a formula which takes into consideration numerous factors such as on mode consumption, standby consumption and screen size/format/type. The European Commission also funds a pan-European database of energy efficient appliances called HomeSpeed. The EC have also developed an Eco-Label ("Flower") that applies to more environmentally friendly products and services.

The International Energy Agency (IEA) has a "One Watt Initiative" energy saving program to cut world-wide electricity losses from appliances in stand-by, launched in 1999. This aims to encourage equipment manufacturers towards consuming no more than one watt when the equipment is in standby mode. The Australian Government has endorsed the one watt standby target for appliances sold in Australia. New Zealand has yet to formally endorse targets.

8.2 Mandatory Programs

So far no mandatory programs set minimum standards for TV energy efficiency although China is planning the introduction of a labelling and MEPS program within the next year. The Japanese Top Runner program, is based around target standard values for energy consumption efficiency in accordance with the Energy Conservation Law, and is obligatory for manufacturers to adhere to them to enhance the energy consumption efficiency of their products on a weighted average basis. In contrast to other overseas jurisdictions however, Japanese standards do not exclude from the market equipment that fails to satisfy the standards. It will be important to ensure that a New Zealand or Australasian MEPS scheme is compatible with other such schemes, with a larger manufacturing or consumer base.

Table 8 Summary of Testing Standards and Energy Efficiency Programs

Equipment Type	Region /Country	Program/ Standard Name	Modes	Target
Standards				
All household mains powered appliances	Australia	AS/NZS 62301(Int.):2003	Standby	Standard defining methods of measurement
Audio, video and related equipment	Australia	AS 62087	All	Standard defining methods of measurement
Audio, video and related equipment	International	IEC 62087	All	Standard defining methods of measurement
All household mains powered appliances	International	IEC 62301	Standby	Standard defining methods of measurement (currently in Draft)
Voluntary Programs				
Televisions	USA & Australia	ENERGY STAR	Standby only	Analog: Standby ≤3W, on 1/7/04 ≤1W Digital: Standby ≤3W, on 1/7/05 ≤1W
Televisions	Europe	GEEA Energy tick	All	Meet index value of 0.75
Televisions	Europe	Eco-label	All	Meet index value of 0.65
Televisions (CRT type)	Europe	EICTA agreement	All	Achieve sales weighted average of 3W in passive standby Improve sales weighted energy efficiency index by 10%
Televisions (Non-CRT type)	Europe	EICTA agreement under development	All	Achieve sales weighted average of 3W in passive standby Improve sales weighted energy efficiency index
All	International	IEA "One Watt Initiative"	Standby only	Standby ≤1W
Mandatory Programs				
Televisions – CRT	China(2005)	Endorsement label	All	EEI ≤ 1.1, standby ≤ 3W
Televisions – CRT	China(2005)	MEPS	All	EEI ≤ 1.5, standby ≤ 9W
Televisions – CRT	Japan	Top Runner	All	Sales weighted MEPS levels based on formula.

Summary – International Standards and Programs

Testing standards are now available for standby power measurement, but no standards currently exist for energy consumption in-use.

Voluntary programs such as Energy Star only target standby energy use. The Energy Efficiency Index promoted in Europe covers in-use mode and at least 20% of European sets comply.

Any New Zealand MEPS scheme should be compatible with any overseas obligatory programs such as Japan's "Top Runner" initiative.

9 Economic Implications

9.1 Energy Cost Savings

The key driver for introducing a MEPS regime is the achievement of savings in the cost of energy used in TVs, both the on and standby modes.

In arriving at a set of figures to carry out the economic analysis a number of assumptions were necessary:

- The first and most basic assumption is the number of TVs, and how that will change over time. Rather than a compounding percentage increase it is likely that the growth of TV numbers will follow a logistical growth or S-curve with saturation effects. The degree to which this applies depends on a number of factors, but a key one is the population growth of New Zealand. Statistics New Zealand predict that with their mid-range Series 5 projection, the population which is currently 4.08 million will reach - and peak - at 5 million by 2041. This assumes, amongst other factors, a net migration gain of 10,000 per year.
- The numbers of new TVs currently sold is 318,847 annually an increase of 25% on the previous year. This degree of increase is unsustainable in the long term, and for the purposes of this analysis the rate of increase was reduced each year by a factor proportional to the inverse of the population increase to the power of five. This gives a reasonable approximation to an S-curve effect. All new TVs are assumed to be used as the principal TV in a household, with 20% of principal TVs being retired to second and subsequent TV status.
- The number of TVs disposed of - or becoming unused - was assumed to be 10% of the stock of second and subsequent TVs. At this rate, the number of disposed TVs is always less than the number of new TVs, allowing for a build-up of numbers.
- Average annual energy use per TV now is 152 kWh. This is based on the figures in 4.1 - average TV power for the set mix at present of 80w, and on-use of 4 hours/day with 20 hours standby giving 440Wh for the first or principal TV, for 344 days a year. The second and subsequent TVs are assumed to use 50% of the energy of the principal TV due to reduced on-mode periods, or 220Wh.
- Business as usual (BAU) will produce a natural reduction in energy usage for TVs of 2% per year[14] (Fig 6.1) from so-called autonomous - natural design improvement savings - by manufacturers.
- Autonomous savings, and moves towards more energy efficient LCD slimline TVs may however also be offset by moves of consumers to larger plasma slimline TVs, or those with more features such as IRD, at the expense of medium size TVs. Thus at this stage it is probably wise to assume no net efficiency improvements in the overall new TV stock.

[14] Huenges Wajer B.P.F., Siderius P.J.S., *Analysis of Energy Consumption and Efficiency Potential for TVs in on-mode, EC report November 1998* http://www.vhknet.com/download/TV_on-mode_final_report.pdf

Figure 1 – Chart of Television Set Numbers in New Zealand.

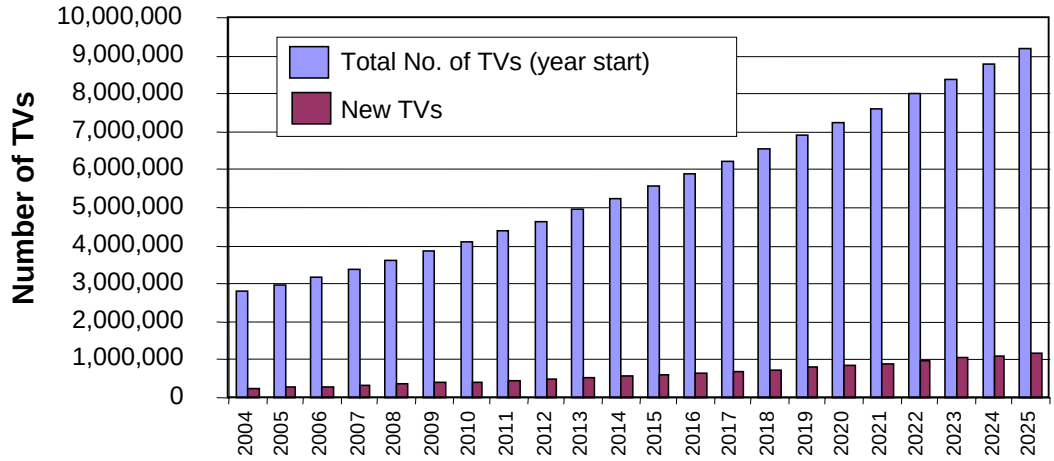
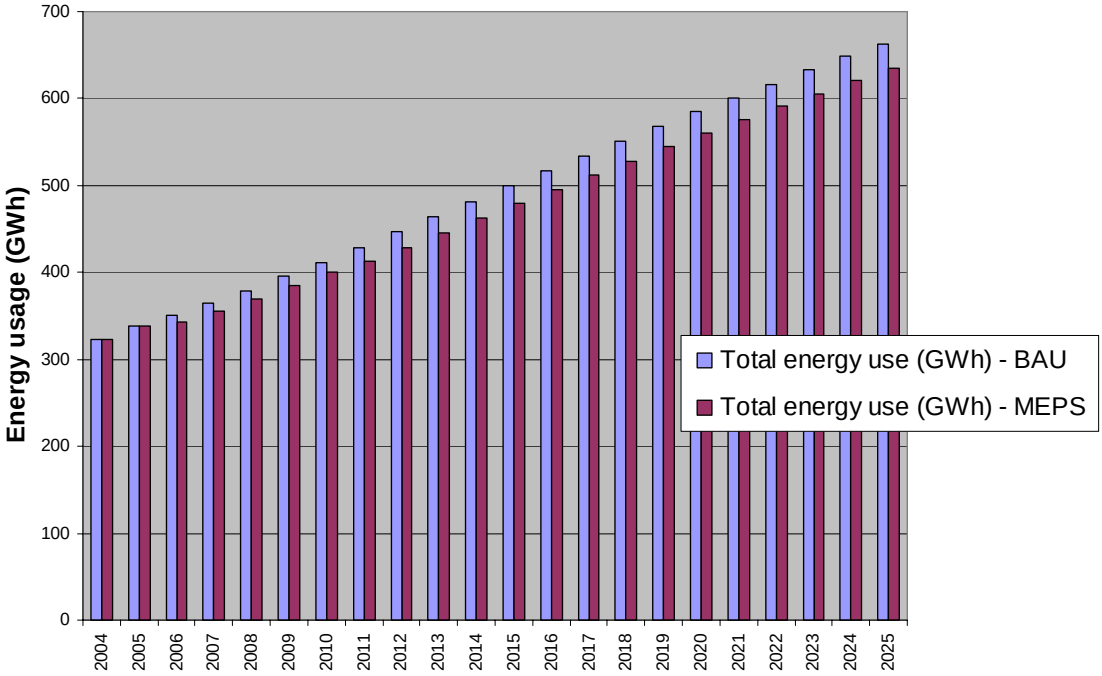


Figure 2 – Energy Usage Figures for Televisions in New Zealand – BAU and MEPS.



The total energy saved is 8 GWh in 2006, when MEPS is introduced, rising to 29 GWh in 2025. The cumulative energy savings between 2006 and 2025 is 392 GWh, and the net present value of these savings at a discount rate of 10% based on a current energy cost of 7.3 c/kWh is $8.3 million.

9.2 Trans-Tasman Trade Agreement

CER is a series of agreements and arrangements that began with the entry into force on 1 January 1983 of the New Zealand Australia Closer Economic Relations Trade Agreement. Total free trade in goods was achieved by 1990 (five years ahead of schedule) with the elimination of all tariffs and quantitative restrictions. The Trans-Tasman Mutual Recognition Agreement of goods (and occupations) means that goods that are acceptable for sale in one jurisdiction can legally be sold anywhere in Australia and New Zealand. A joint communiqué

from the Australia New Zealand Trade Ministers' Meeting in 2003 stated that: "To this end, we are committed to ensuring that the Arrangement is supported by the continued development of joint Australian and New Zealand standards. We recognise the importance of joint standards to our business communities."

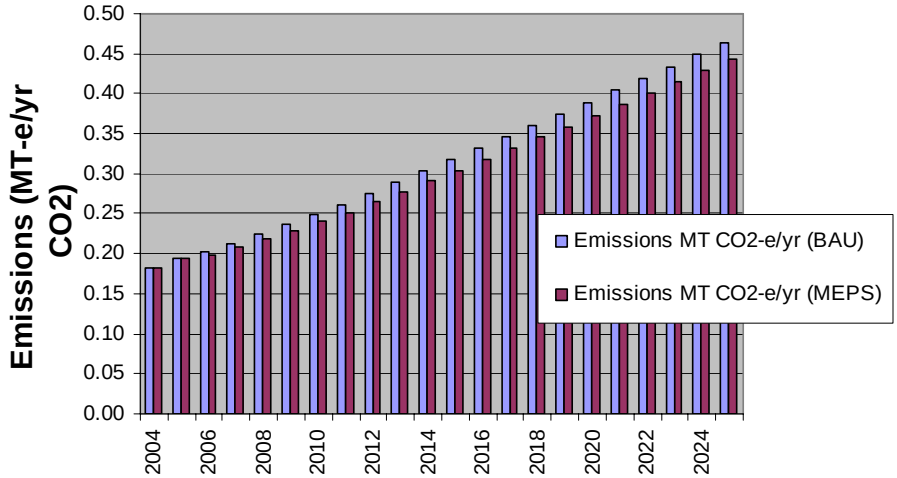
There are no specific dispute resolution procedures. The close and long-standing political relationship between Australia and New Zealand means that any issues of grievance or concern are addressed through discussion between the two governments. The effect of the TTMRA is that if Australia has a MEPS regime, whilst New Zealand does not, theoretically it would be possible to import non-compliant TVs to Australia on the grounds that the equivalent set was acceptable for sale in New Zealand. In practice the selling margin between the two grades of set, would not be sufficient to offset the loss of marketing edge of such a move. Thus the dangers are more apparent than real.

9.3 Greenhouse Gas Reduction Potential

Avoided power costs are usually considered to save energy at marginal generation costs, which are thermal, and thus emit CO_2. The methodology is demonstrated in some detail in Meridian's Te Āpiti design document[15] which shows a CO_2 emission factor for thermal generation rising from of 572 g CO_2/kWh in 2005, to 698 g CO_2/kWh in 2025. The average over this 20 year period is 635 g CO_2/kWh.

Annual energy savings increase from 8 GWh in 2006 to 29 GWh in 2025, with a cumulative saving in this period of 392 GWh. The greenhouse gas reduction inherent in these figures increases from 4,700 tonnes CO_2-e/yr in 2006 to 20,000 tonnes CO_2-e/yr in 2025. The net present value of the cumulative savings costed at $15 per tonne, a conservative figure based on estimates of the charge likely to apply from 1 April 2007, and a discount factor of 10% is $10.78 million.

Figure 3 – Savings in CO_2 Emissions – BAU and MEPS.



[15] Te Āpiti Wind Farm Project: Project Design Document (ERUPT 3) www.senter.nl/sites/erupt/contents/i001413/ meridian_energy_eru _03_ 06_pdd_final.pdf

10 Policy and Program Approaches to Improve Energy Efficiency

Table 9: Summary of program approaches/policy tools

Policy Tool	Positive elements	Negative elements
Information programs: Brochures & point of sale material	• Prompts the consumer at point of purchase • Is easy to disseminate (such as through retail outlets)	• Materials can become outdated • Assumes energy efficiency is part of decision making process
Information programs: Articles/ advertisements in popular media	• Receives wide-spread coverage	• Expensive • Requires continual repetition to maintain effectiveness
Appliance Labelling: voluntary endorsement label	• ENERGY STAR is supported by Aust Govt and already covers equipment types identified in this report • A positive marketing initiative for manufacturers producing energy efficient products	• Wouldn't be practical to introduce similar endorsement label due to market place confusion • ENERGY STAR does not currently cover in-use energy consumption
Appliance Labelling: voluntary endorsement label with comparative information	• Provides more information to the consumer on the energy performance characteristics • An award label that shows the best performing product compared to average is simple for consumers to interpret • Encourages industry best practice	• Effectiveness is diminished unless the label is mandatory as the consumer would need to compare the entire range of products • Comparative labels can be confusing to consumers • Information in the label not guaranteed to influence purchase decision
Appliance Labelling: Mandatory Energy Label	• Encourages industry best practice • Could be integrated with MEPS	• Information in the label not guaranteed to influence purchase decision, especially if $ savings are relatively small
Appliance Labelling: Warning label	• Encourages industry best practice • Potentially simple for the consumer to interpret	• A new concept not yet tested in Australia or internationally
MEPS	• Addresses both in-use and standby power consumption • Potential energy savings are significant • Results in immediate removal of poor performing products from the market • Encourages innovation in industry • Does not rely on consumer decision making	• Seen as being restrictive by some suppliers and adds additional testing burden and costs

10.1 Information Programs

As in Australia, apart from the ENERGY STAR program which will be familiar to workers in office environment, or those using personal computers, there are no other programs currently in New Zealand addressing the issue of energy efficiency of TVs. The ENERGY STAR program does not address the issue of on-mode energy use.

10.2 Labelling Programs

Labelling programs can be voluntary, mandatory or a combination for part of the market. Voluntary labelling is more in the nature of consumer information, providing comparative information in a format agreed by the signatories. Mandatory labelling also provides

consumer information similar to that currently applied to whitegoods, but in a format regulated by standards. A MEPS regime is a government regulatory programme that not only covers labelling but actively excludes from the market products that do not meet minimum energy performance standards.

Realistic options for New Zealand will either be associated with other international programs, since our TVs are sourced from overseas, or included as part of an integrated Australasian MEPS approach.

Ideas canvassed in the AGO NAEEEP report are summarised in Table 9. The most acceptable option appeared to be to develop a comparative star-based labelling system in conjunction with the introduction of a MEPS regime for TVs.

10.3 Minimum Energy Performance Standards (MEPS)

MEPS are documents produced under the aegis of Standards New Zealand and/or Standards Australia, which means that a product sold on the New Zealand market must comply with specific criteria for energy efficiency. New Zealand works closely with Australia to ensure MEPS levels are aligned. All of these standards are, or will soon be, joint standards with Australia.

By introducing a mandatory MEPS regime, the aim is firstly (Stage 1) to remove the approximately 30% of the least efficient new products available at the retail level; secondly (Stage 2) to move towards the more stringent Japanese MEPS levels, and the EU targets.

It may be difficult for New Zealand to match the Japanese levels in the first instance as they are very stringent MEPS although our product is primarily based on Japanese and to a lesser extent European designed product, largely manufactured in Asia.

The EU has not implemented a MEPS, but has targeted reductions with voluntary agreements with major suppliers. A voluntary agreement could work in New Zealand but could potentially be sabotaged by the smaller suppliers ratcheting up their market share without having to comply with the agreement.

As utilised in Europe, the method of measuring energy efficiency should take into consideration the screen size, aspect ratio, type of receiver/processor, scan rate and other consumer-desired features. This ensures that manufacturers are not penalised simply for providing more features for consumers. The formulae for determining energy efficiency are called algorithms, and the methodology used for a proposed MEPS would be similar to the approach used by the EU's GEEA voluntary labelling program and the European Industry Self-Commitment.

The EU has adopted a method of test, with the full support of the GEEA and EU, so there is no need to consider other testing methods. Australia and New Zealand could use the EU method-of-test standard (IEC 62087), which has been adopted as an Australian New Zealand Standard (AS/NZS 62087:2004: *Methods of measurement for the power consumption of audio, video and related equipment*). However the Australian standards committee TE001 is now working with the EU in reviewing the test method, and it is likely that it will adopt a new method that simplifies the current test, allowing a comparison with all screen technologies. New Zealand is currently not represented on this committee, but could be included.

10.4 Costs of MEPS

The Australian TV MEPS report did not address this issue, but stated:

"A full economic study has not been conducted, as this usually is undertaken as part of the Regulatory Impact Statement (RIS) process when more information is available. However, it is worth noting that when mandatory programs are implemented through regulations, the requirements apply equally to manufacturers and importers. As a result, any additional costs of compliance are borne by all competitors. This situation is not always the case for voluntary programs, where companies who 'do the right thing' might be undercut by other company's products which do not match their energy performance standards."

The likely energy savings compared with the cost of introducing and operating a MEPS scheme has been assessed. According to EECA the cost of running such a scheme is likely to be less than $100,000 a year, together with some initial setup costs, of say equal value. The net present value of these costs at a discount rate of 10% is $2.2 million. Compared with the NPV of the electricity saved of $8.3 million, there is a substantial benefit cost ratio of approximately four, above the threshold needed to proceed. If the savings in carbon charges are included the benefit are almost doubled.

Secondly the cost of applying a MEPS regime would be partly borne by consumers. However in practice because of the competitive nature of the market, these costs, which would only be nominal, may not be passed on. For example a wide screen CRT TV that would retail for $2,499, might attract additional MEPS costs of $5 per unit. Because of the pricing bands (or points) used by retailers to set prices, where prices are set to keep below break points (e.g. $2,499 rather than $2,550), unless the increase takes the new price into the next higher band, it may not be applied.

Similarly the costs of applying and administering MEPS, apart from the testing and labelling of product, need to be assessed and agglomerated with other already existing MEPS programs in order to minimise them. This would be a matter of natural efficiency rather than a need to justify the implementation of a MEPS regime.

Summary – Policy and Program Approaches to Improve Energy Efficiency

Realistic policy options for New Zealand will either be associated with other international programs, since our TVs are sourced from overseas, or included as part of an integrated Australasian MEPS approach. Voluntary programs may be sufficient.

A New Zealand MEPS scheme should encourage the removal of the worst performing 30% of sets at the retail level.

The costs of applying MEPS would likely be passed on by retailers, but due to the competitive market may also be absorbed. Total costs of a MEPS scheme must be minimised to achieve viable cost savings, as well as energy savings. The benefit cost ratio of the present value of energy savings to costs of a MEPS scheme is approximately four, excluding any carbon charging.

11 Recommended Policy Options for New Zealand

11.1 General Policy Recommendations

Energy consumption of TVs in New Zealand is estimated to be 320 GWh, or around 5% of total household use. This is approximately 40% of the annual increase in energy required by New Zealand each year. The countries of origin for the TVs we import are implementing either mandatory or voluntary policies to improve the efficiency of this growing form of energy consumption.

In particular Australia originally aimed to introduce a combined MEPS/labelling scheme by 2006. However recent stakeholder feedback in Australia opposed mandatory labelling, and it is unlikely to proceed, although voluntary labelling and MEPS will still go ahead.

It would be advisable to keep our alignment with Australia, and it is recommended that New Zealand introduce a similar scheme to whatever is finally agreed to in Australia. MEPS and comparative labelling is still a viable option with only voluntary labelling. It will be necessary to rely on the competitive nature of the market to exclude products that don't comply with MEPS.

11.2 MEPS

A MEPS for televisions in New Zealand should be implemented in tandem with Australia. Consultation with the importers and major retailers will be necessary to ensure that there is no undue resistance to the scheme, to maximise compliance and adherence to the principles of the scheme.

The MEPS should cover both on-mode and standby energy consumption. The setting of MEPS levels should be designed initially, as in Australia to encourage the removal of the 30% of worst performing TVs from the marketplace, and to match the best practice levels of our product source countries. The correlation between energy efficiency indices for TVs and any labelling scheme needs to be decided on in consultation with Australia.

The Australians already have an Australian Standards Committee TE 1 which may act as the vehicle to implement the MEPS scheme. New Zealand would have to investigate representation and integration of its policies with the work of that committee.

11.3 Labelling Scheme

The comparative labelling scheme proposed by Australia would follow the six-star energy rating system based on the EU model. The purpose of such a label is to allow the consumer to compare a TV within a particular technology (e.g. widescreen, SDTV, HDTV) and screen type (e.g. CRT, LCD, plasma). Alternatively labels could be developed that merely compared all technologies/screen types although this would be less useful. Considerable work is needed to identify reference TV values, and levels of energy use for various star ratings.

It is not recommended that New Zealand do other than monitor this work, together with Australia.

11.4 Consultation

Industry, through its representative body the Consumer Electronics Association of New Zealand have already made a submission on the AGO proposals regarding TVs. Their concerns focused on the following aspects:

- The mandatory nature of the proposal, which they believe can be met by the market.
- The need for the scheme to apply across all screen types, rather than apply a CRT rating to all.
- The need for labels to be applied in the course of normal packaging.
- An expectation that the standby power target should remain at 3W.
- Concerns about the timeframe, which they would like to have a 3-year lead-in time.

They expect to be consulted further should such a MEPS scheme be proposed to be introduced in New Zealand.

Summary – Recommended Policy Options for New Zealand

A MEPS for televisions in New Zealand should be implemented in tandem with Australia which is now likely to implement a voluntary scheme. The MEPS should cover both on-mode and standby energy consumption. Stage 1 should encourage the removal of the worst performing 30% of sets at the retail level.

Any labelling scheme should be based on the six-star EU scheme, and developments monitored with Australia.

Consultation with the importers and major retailers will be necessary to ensure that there is no undue resistance to the scheme, to maximise compliance and adherence to the principles of the scheme.

12 Implementation Program

The Australian implementation program is show in Table 10

Table 10: Proposed Implementation Plan for Recommendations

Item		Date(s)
1.	Presentation of consultant's initial Report to Steering Committee	1 October 2003 (completed)
2.	Consultant's revised Draft Report sent to Steering Committee	August 2004
3.	Industry response to recommendations	Mid September 2004
4.	Government publication of MEPS Proposals for Televisions	October 2004
5.	Consultation on the MEPS with stakeholders (including manufacturers and consumers)and consumer research	October 2004 - March 2005
6.	Product Testing including international collaboration	January 2005 - March 2005
7.	Consultation on Draft Standard(s) Part 2 by Standards Australia	October 2004 - March 2005
8.	Publication of Standard by Standards Australia	April 2005
9.	Regulatory Impact Statement(s) undertaken	2005
10.	Voluntary labelling start	April 2006
11.	Introduce MEPS	April 2006
12	Mandatory labelling	October 2006

Obviously if this program has been adhered to, New Zealand is somewhat behind, particularly in becoming deeply involved in any standard making. Because New Zealand is more responsive than Australia, some catch up may be possible, so that Items 7-12 could still be achieved with no more than six months slippage. Full implementation could be achieved by the end of 2006.

13 Summary and Conclusions

Televisions use around 320 GWh per year in energy, and the current stock of TVs is less efficient than present day sets, being largely CRT-based. Newer LCD slimline sets can offer reduced power consumption, but even within a particular set type there is a range of energy use depending on the efficiency of the designs used, and the consumers' preferences for the type of set chosen.

The Australian Greenhouse Office has decided to introduce a voluntary MEPS and labelling scheme for TVs for implementation by October 2006. This is designed to encourage the removal of the worst performing 30% of sets presently being offered for sale on the retail market. There are equivalent benefits for New Zealand in introducing a similar scheme, and indeed implied obligations under the TTMRA to do so.

The benefits to New Zealand would accrue in energy savings, and avoided carbon charges over the next 20 years with net present values of:

- Energy Savings $8.3 million
- Carbon emissions saved $10.78 million

The costs of such a scheme would be largely funded by retailers and consumers, and could cost $25,000 in administration per annum. The net present value of this at $525,000 is far less than any savings achieved.

It would be possible to introduce such a scheme by the end of 2006 if decisions and consultation begin as soon as possible.

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APPENDIX A – Potential Stakeholders

Stakeholders with an interest in the future development of Television regulations include manufacturers/importers, government agencies, retailers and industry associations. A list of potential stakeholders is provided below.

Importers/Manufacturers
Fujitsu
Grundig
Hitachi
Hyundai
JVC
LG Australia
Panasonic
Philips
Samsung Electronics Australia (NSW)
Sanyo (The Warehouse)
Sharp Corporation
Sony
TEAC
Thomson
Toshiba

Government Agencies
Energy Efficiency and Conservation Authority
Ministry of Economic Development
Ministry for the Environment
Parliamentary Commissioner for the Environment

Industry Bodies
Consumers' Electronic Association of New Zealand